We wish the authors could have given us some information as to the *modus operandi* of the *Teredo* in excavating its cylindrical tube, instead of merely quoting Kater's opinion that the shell is the boring organ. One thing is certain, and indeed has been admitted by Kater, that the foot of *Teredo* is in front, occupying the bottom of the tube, while the shell at the same time occupies that part of the tube which lies immediately above the foot, and is closely pressed against the sides of the tube. To suppose that the position of the foot and shell could be reversed by the animal, so as to make the shell lie at the bottom of the tube and the foot on one side during the process of excavation, is quite inconsistent with our knowledge of the *Teredo* and of the habits of other boring and burrowing Mollusca. *Solen*, *Cardium*, *Natica*, *Actæon*, and many other kinds burrow in sand by means of their strong muscular foot; *Pholas dactylus* occasionally does the same; and the limpet uses its foot only for excavating the hard rock in which it is sometimes more or less deeply imbedded. The gradual enlargement throughout of the tube of *Teredo*, especially at the opening (where the siphons are placed), cannot possibly be caused by the shell, which invariably lies at the other end; and the prickles which cover the surface of the shell, and enable it to act as a fulcrum or *point d'appui*, could not be renewed if they were continually employed in rubbing away the wood. There can scarcely be a question that the foot is the sole instrument of perforation in *Teredo*, as it is in *Solen*, *Pholas*, and *Patella*.

J. GWYN JEFFREYS

OUR BOOK SHELF

The Student's Manual of Comparative Anatomy and Guide to Dissection. Part I. (Mammalia). By G. H. Morrell, M.A. (Longman and Co.)

THIS work is in two parts, which are of such different characters that they must be considered separately. The first is intended to include a short and complete summary of the main facts of the anatomy of Mammalia. This is a large undertaking, and one which a resident in Oxford has not full opportunities of completing; for the advantages in any place other than London, are not sufficient to enable any single student, however enthusiastic, to get familiar with many of the subjects discussed. There is a want of vividness and point in many of the statements, several of which are too inclusive. Referring to the lobulation of the kidneys, the seals and whales are mentioned as presenting it, but why are the ox, otter, and rhinoceros omitted? The peculiarity of the stomach of the chevrotain is not referred to, and all we can possibly infer as to that of the peccary or hippopotamus is that it is constricted into two or three portions, which is undoubtedly not enough. Half a page only is devoted to the peculiarities of the liver throughout the class, and that of man is called simple, while that of the Ruminants is included among the multifid. The spleen of the marsupials is stated erroneously to be bent or bilobed.

But the great and inexcusable imperfection of the work is the omission of the description of the generative system, which no amount of argument could persuade us will prove of the slightest good in any way. It only engenders a mystery and curiosity in the mind of the younger students, as to peculiarities of structure, which if they were treated in the ordinary routine, would, as they undoubtedly are among medical students, be looked upon in nothing but a common-place manner.

The second portion of the work, the guide to the dissections of the brain, heart, &c., of the sheep are excellent, and will be found of great value; they have long been wanted by teachers. A carefully compiled synopsis of the cerebral convolutions in man and the higher apes, from the work of M. Gratiolet, terminates the book.

Académie Royale de Belgique. Centième Anniversaire de Fondation. Two vols. (Brussels: F. Hayez, 1872.)

THESE two stout volumes, intended as a memorial of the celebration of the hundredth anniversary of the Belgian Academy, treat of a great variety of interesting and valuable matters. The Belgian Academy of Science, Literature, and Art was founded by Maria Theresa on December 16, 1772, but as December is not a very suitable month for a great public gathering of men from all parts of Europe, the Academy held its centenary fête on May 28 and 29, 1872, and it did it very royally, in presence on both days of His Majesty the King of the Belgians, who gave the opening address, and entertained members and friends on the second day in his palace at Brussels. There took part in the celebration distinguished deputies from all the countries of Europe and from America, and altogether it seems to have been a great success. In these volumes will be found a detailed account of all that was said and done, verbatim reports of all the speeches made, and of all the interesting papers read. The Academy began to make preparations for the centenary celebration in 1869 by the appointment of a commission. This commission appointed members of the various classes of science, literature and art to prepare papers giving accounts of the work done in these classes from the commencement, and others to do the same for the various literary, antiquarian, artistic and scientific subjects with which the Academy deals. From this it may be surmised that these two volumes contain matter of very great value indeed. The first paper is by M. A. Quetelet, giving a sketch (170 pages) of the history of the first century of the Academy. But the second volume will be the more interesting of the two to scientific men; we can only indicate its contents:—Astronomy in the Royal Academy of Belgium from 1772 to 1872, by M. E. Mailly; Report on the Mathematical works of the Academy during the same period, by M. J. M. de Tilly; Report on works in the Physical Sciences, Meteorology, and Physical Geography, by M. J. Duprez; Report on works in Chemistry, by M. L. G. de Koninck; Report on works in Zoology, by P. J. van Beneden; Report on works in Botany and Vegetable Physiology, by M. E. Morren; Report on works in Geology and Mineralogy, by M. G. Dewalque.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

Biela's Comets

THE present note is designed to show that several comets move in nearly the same orbit with that of Biela; that they probably entered the solar system *as a group*; and that, after making their first perihelion passage in close proximity to each other, they were, when receding from the sun, thrown into their present orbits by the disturbing influence of Jupiter.

1. *Was the comet of* 1772 *identical with that of Biela?*—The mean of the seven consecutive periods between January 2, 1806, and September 23, 1852, is 2437·7 days. Counting five periods of the same mean length from February 17, 1772, brings us to July 2, 1805—six months before the perihelion passage of 1806. In other words, the mean period between 1772 and 1806 was greater by about thirty-seven days than that between 1806 and 1852. The perturbations during the half century succeeding the apparition of 1772 have not been computed. It seems very unlikely, however, that the difference of periods

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could thus be accounted for. We conclude, therefore, that the comet of 1772 was not that of Biela.

2. The first comet of 1818 is regarded by Dr. Weiss as a probable member of the Biela group.* This body, discovered by Pons, was visible only four days. Its elements, as computed by Pogson, have a striking resemblance to those of Biela's comet, the longitudes of the ascending nodes differing by only 1°. There can be little doubt that it was connected, in its origin, with the comet of Biela.

3. The companion of Biela, observed in 1846 and 1852, is another comet of the same cluster. The fact that several cometary masses move in orbits almost identical, may afford a plausible explanation of the division of Biela's comet. Was one member of the group overtaken by another as they were approaching perihelion in 1845, and was their separation after imperfect collision the phenomenon observed at that epoch?

4. The comet detected by Pogson, at Madras, on December 2 and 3, 1872, may have been another member of the same family. Its perihelion passage occurred nearly three months after the time computed for that of Biela. Prof. Newton has remarked † that so great a lengthening of the period could not probably be explained by planetary perturbation.

M. Hoek has shown ‡ that certain comets have been associated in groups before entering the solar domain. When the members of such cometary systems are widely separated, they may pass round the sun in very different orbits. The comets, however, which constitute the Biela cluster must have entered our system at small distances from each other, since their orbits are nearly coincident. These orbits, between longitude 255° and 265°, pass within no great distance of that of Jupiter. The group had perhaps made its first perihelion passage in a parabolic orbit. Receding from the sun, it fell under the controlling influence of Jupiter; the comets had various positions in relation to the planet, and hence the orbits resulting from the attraction of the latter were slightly different.

We might regard the comet of 1772, the companion of Biela, and Pogson's comet of 1872, as probably identical, but for the small increase of distance between the two Biela-comets in the interval from 1846 to 1852. The period would be about 2456 days.

That the comets of this cluster have been moving in their present orbits but a comparatively short time is rendered probable by the fact that no two of the members hitherto detected have become widely separated, and that, notwithstanding the frequency of the return to perihelion, the meteoric *débris* is much less diffused than in the case of other known streams.

Were all the members of this cluster originally united in a single comet, or did they *enter the solar system* as a group? To this question, perhaps, no satisfactory answer can yet be given. It seems probable, however, that the united masses would have formed a somewhat conspicuous object, too brilliant to have entirely escaped observation. DANIEL KIRKWOOD

Bloomington, Indiana, April 15

Earthquake in Dumfries

WHILE sitting in my lonely house in a retired but beautiful glen of Dumfriesshire, I was aroused on the evening of Wednesday 16th current, at ten minutes to ten o'clock, by one of the most singular noises ever I had listened to. The tone of it was somewhat like thunder, but it did not rise and fall in pitch. It lasted, perhaps, for twenty seconds, and was accompanied by a slight tremor. At first I thought it was a two-horsed carriage coming, and at a lumbering pace, and then, with some hesitation, I took it for thunder, but next day I found that it was generally recognised as an earthquake. The shaking was very perceptible in some localities. It extended through the parishes of Closeburn, Morton, Penpont, Glencairn, and Tynron, over a length, I am safe to say, of ten miles. Dr. Grierson of Thornhill Museum felt it as a rude shock. In Tynron village there was some alarm, as one family thought it was the wall of the churchyard that had fallen. On December 24, last year, a similar shock was felt in some parts of Upper Nithsdale. Although I have resided for many years in Dumfriesshire, these are the only occasions on which there was any surmise of an earthquake. The local papers have said almost nothing about it, but I am sure this will interest some of your readers.

Tynron School, April 23 J. SHAW

East India Museum

ALLOW me to make yet another suggestion (in addition to those of P.L.S. and Prof. Newton), with regard to the disposal of the natural history collections at the India House. It seems to me to be one of the greatest popular delusions, that specimens of natural history necessarily require lofty halls and spacious galleries for their preservation and exhibition in a useful manner. I hold, on the contrary, that, with few exceptions, they far better serve educational and scientific purposes when arranged in ordinary apartments. All the scientific work in the British Museum is done in small rooms; and the palatial galleries with their crowded myriads of specimens and miles of glass cases, however instructive they may be (or might be made) to the public, are a positive hindrance to scientific work. I am very much mistaken if all the India House natural history collections might not be suitably placed in two or three ordinary sitting rooms, and so arranged in cabinets and boxes as to be far more convenient for reference and study than they have ever been. The rent of a moderate-sized house in an airy situation, say 250*l*. with an equal sum for the salary of an efficient Curator, and a small grant for cabinets and the necessary books of reference, is all the expense required to make this interesting collection completely accessible to all who wish to consult it. Every one interested in Indian natural history would then visit it. It would again receive gifts of collections from travellers, Indian Officers, and other persons interested in the natural history of the East; and its increase in value from this source alone might go far towards furnishing a tangible equivalent for the expense incurred, while it would certainly render the collection a better representation of the Indian fauna than it is at present, and more worthy of a place, at some future time, in the proposed grand Indian Museum.

Such a modest establishment would also, I believe, do much good by showing at how small an expense a really useful scientific museum may be kept up, and would thus encourage the formation of local museums in cases where 20,000*l*. or 30,000*l*. cannot be raised for a building. It would not, of course, be a show museum for the uneducated public to wander and gaze in; —the British Museum serves that purpose. But it would prove greatly superior to any such mere exhibition, as a means of furnishing definite information on Indian zoology, and enabling any intelligent inquirer to obtain some idea of the many wonderful and beautiful forms of life which characterise, what is at once the smallest and the richest in proportion to its extent, of the great zoological regions of the globe.

ALFRED R. WALLACE

IT will be greatly to be regretted if even your suggestions are adopted as a remedy for the present neglect, and the claims of scientific men and of the public at large for a Government museum be abandoned. It is very desirable for Indian interests that the Museum shall be, as before, connected with the Indian department.

It is quite true accommodation in the sky-parlours, with casual access by a lift, is given for the industrial collections so well conducted by Dr. Forbes Watson, and which collections, as chairman of the Indian Committee of the Society of Arts, I feel bound to contend for as of great value to England and to India.

There is no solid ground for letting the Government go. They acquired in the like way the property of the Levant Company, and attempted to shirk the rights and obligations, but were compelled to maintain the public buildings, churches, hospitals and burial-grounds at Constantinople, Smyrna, &c. It must be owned they constantly attempt to evade the obligations.

They are now engaged in paying off the stock of the old East India Company, of which they have acquired the territory, houses, property, prerogatives, &c., and they must simultaneously accept every obligation, pecuniary and moral.

This was a museum for the service of England and the service of India, and there is no reason why it should not be kept up. There is, it is true, a growing licence in this day for representing us as usurpers and oppressors of India, whereas the peace, prosperity, and progress of India have been created by us, and were we to withdraw, would be destroyed by the sanguinary conflicts of the various races of conquered and conquerors constituting the populations.

We ought to stand on our right to share in the prosperity of India as a prerogative belonging to us. Besides, for the benefit of India, the collections are kept up by Englishmen, for there is

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* Astr. Nach., No 1710.

† American Journal of Science, April 1873.

‡ Monthly Notices of the R.A.S., vol. xxv. p. 243.

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